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ABSTRACT

A sampling is presented of items from the 1979-80 survey of research and publications in and about the University of Minnesota General College. This includes these discipline areas and sample research projects: recent General College-based doctoral dissertations (title and authors); counseling and student development research reports, 1979-1980; arts, communication, and philosophy research (this example is of a program to give foreign students a command of English language); social studies (peer group tutoring in a psychology course); science, business, and mathematics (self-paced instruction in mathematics); and General College in-house publications. (MSE)

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RESEARCH AND PUBLICATION IN GENERAL COLLEGE

A university faculty does more than teach; it adds to knowledge. Research and publication are central among its responsibilities. As part of the University of Minnesota, therefore, the General College faculty shares these central responsibilities. While individual members are encouraged to carry out investigations connected with specialized fields, such as those in which they earned advanced degrees, major and continuous attention must be given to work connected with the unique focus of General College. This focus is upon undergraduate education, particularly general education, interdisciplinary courses, experiential learning, paraprofessional education, retention programs, non-traditional degrees, and student development studies. . .

Because there are few, if any, colleges with our kind of mission and our kind of students functioning in a university setting, and because many of the subjects we address are matters of concern to institutions scattered throughout the country as well as to Minnesota's community colleges and state universities, we have an obligation to report results of our experiments at national conventions, submit them for publication in major journals, see that they are listed in Resources in Education by the ERIC Clearinghouse for Higher Education, and give them regional distribution in our own college publications. - Planning for the 1980's in General College, 21-22

To argue that good teaching in a free-choice general education program is the chief, perhaps even the only, professional responsibility of its faculty comes close to saying that the function of General College on this campus is primarily custodial. To accept this premise, in turn, leads to viewing General College open admissions not as a policy resting on principle, but as a convenience freeing other faculties to teach only those they select; simultaneously allowing the institution as a whole to claim the outwardly democratic and politically popular role of the great American, land-grant university. Whatever the relative emphasis given teaching and research may have been at various points in the past, the statement at the top of this page clearly demonstrates current faculty commitment to studies and investigations carried on within the context of present General College mission and goals.

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The triple educational task General College derives from its open admissions policy, dedication to the improvement of undergraduate education, and responsibilities as an instructional unit in a research-oriented university, leads its faculty today into experiments, studies, and evaluations which are almost bewildering in their number, variety and complexity:

Aging Studies
Associate in Arts Renovation
Auto-Tutorial Biology Laboratory
Baccalaureate Program Development
College for Working Adults
Commanding English
Comprehensive Examination Assessment
Community Service Internship
Competency Assessment of Work Experience
Co-Op Education
Computerized Regristration
Counseling Intervention Techniques
Day Community Program
Evaluation: Human Servies Generalist, Legal Assistant, etc.
Expanded Human Services Model
Experiential Learning Policies
Field Experience Credit Guidelines
Fire Science Program
Functional Communication
Humanities Interest Survey
Group Advising: Business Studies
Labor Market Research
MacPhail Connection
Package Course Construction
Peer Tutoring in Psychology
POST: Peace Officers Standards Training
Professional Sales
Reading, Study Skills Center
Retention Program
Science Anxiety
Sponsored Off-Campus Learning
Stress Management
Technical Reading
Televised Instruction
Upward Bound
Urban Studies

Very few General College faculty members can read this list without identifying themselves with one or more items on it.

Lengthy as this enumeration is, analysis reveals some familiar, on-going concern clusters or common denominators:

...studies of student body characteristics
...curriculum development in response to student needs
...symbiotic combinations of general and occupational education courses
...self-paced courses of study
...effective teaching and counseling

The General College faculty may be more research-concerned today than it has been at some points in its recent past, but excellent classroom teaching still is the goal of many of its investigations. Eight members of its faculty have The Horace T. Morse - American Oil Company Award for outstanding contributions to undergraduate education at the University of Minnesota.* A primary faculty objective continues to be conservation of human resources by means of effective teaching and counseling.

Ongoing common denominators aside, the magnitude of this faculty research effort poses problems and questions for the new college administration. How can this work best be facilitated, supported, coordinated, rewarded? What priorities ought to be set? Who decides? When will the faculty see central concern for research reflected explicitly in the composition and functioning of the central college office?

First steps are being taken to find answers to these, and other, questions. As Associate Dean for Academic Affairs of General College, Thomas C. Buckley is responsible for fostering college research. He proposes to proceed in consultation with research coordinators in each division as follows:

Arts, Communication and Philosophy: Dr. J. Michael Arrington
Social and Behavioral Sciences: Dr. Thomas Brothen
Science, Business and Mathematics: Dr. Douglas Robertson
Counseling and Student Development: Dr. John Romano

This Research Consulting Group (RCG) will advise Dean Buckley about publication of General College Studies while working with him to coordinate the research mission of the college as a whole. It is anticipated that the dean and the RCG may one day be assisted by research associate and technical personnel holding appointment in the Office of the Dean, and that college funds may annually be set aside to facilitate and support this important General College function.

(*) George H. McCune, 1967; George McCutcheon, 1971; Leon Reisman, 1972; Forrest J. Harris, 1974; Norman W. Moen, 1975; Evelyn U. Hansen, 1977; Fredric R. Steinhauser, 1978; Jerome E. Gates, 1980.

This edition of Newsletter is devoted to the subject of General College research and General College publications. Obviously, it can do so only in a selective fashion. Space does not permit detailed descriptions of every segment of the extensive 1979-1980 inventory. Accordingly, the pages which follow contain sampler information, as follows:

Recent General College-Based Doctoral Dissertations
Counseling and Student Development: Research Reports 1978-1980, John Romano and Others
Arts, Communication, and Philosophy: Comanding English, Sandra Dylla and Jill Gidmark
Social Studies: Peer Group Tutoring in a Psychology Course, Henry Borow and Thomas Brothen
Science, Business, and Mathematics: Self-Paced Instruction in Mathematics, Douglas Robertson and Joan Garfield
General College In-House Publications

Recent General College-Based Doctoral Dissertations

One splendid benefit of its situation on a university campus is that aspects of General College frequently are the subject of research carried out by candidates for advanced degrees who are working under the supervision of members of the Graduate School faculty. Certainly few undergraduate programs have been the object of this kind of scrutiny as continuously as that of the General College. Examples of recently, or soon-to-be-completed doctoral studies based on General College are as follows:

Richard Byrne	The Acceptance of Twentieth Century Music by General Education Students (1980)
Joan Garfield	Teaching and Evaluating the Problem Solving Process in an Introductory Statistics Course (c1981)
Susan Knoblauch	An Investigation of Affective and Achievement Outcome in a College Arithmetic and Elementary Algebra Program Using Four Treatment Goal Structures (1978)
Gail A. Koch	The General Education Movement in American Higher Education: An Account and Appraisal of its Principles and Practices and Their Relation to Democratic Thought in Modern American Society (1979)

Douglas F. Robertson	An Investigation of Aptitude Treatment Interactions (ATI) with Respect to Programmed and Lecture Treatments in a College Course in Basic Mathematics (1979)
Carol M. White	An Evaluation of Three Instructional Strategies Using Diagnostic Tests and Audio-Taped Study Instruction in an Individualized Remedial Mathematics Program for College Students (1978)
Gloria Wood	Use of the Interpersonal Tracking Task to Study Personal Perceptions (c1981)

Counseling and Student Development: Research Reports 1978-1980

The CSD Division, Dr. John Romano reports, has been active in expanding its services through interventions focused on student achievement and retention, career development and stress management. Major studies are as follows.

Student Achievement and Retention: Professors Romano and Michael Arrington describe an activist counseling program designed for first quarter students who lack the necessary academic and personal skills to be successful in the College. They identified the assumptions in this preliminary report to the faculty - Michael Arrington and John L. Romano, Counseling Delivery to Academically Underprepared University Students (GC CSD December, 1979)

Career Development: A continual need of General College students in adequate career and educational planning. More than two-thirds of them enter the College without clearly defined career and educational goals. While this in itself is not necessarily negative, what is important is that most of these students have little idea of how to make decisions about goals. Too many think of these matters only at registration time.

Primarily through the leadership of Professor Gloria Wood, the CSD Division has significantly expanded its career/educational services to students. In addition to individual counseling, GC 1502 Career Planning has been offered in recent quarters as a means of developing self-awareness. The importance and popularity of this course has been attested to by the demand for additional sections each quarter. The Career and Educational Information Library in Nicholson Hall 9, in conjunction with the Minnesota Occupational Information System (computer access), are additional contributions to the Division's career and educational planning services.

Stress Management: Through funds provided by a Center for Educational Development grant, stress management program employing biofeedback technology has been available in the College during the past year. Faculty and students alike are interested. Professors Romano and Fred Lopez presented an account of the program at this year's national convention of American College Personnel Association in Boston. Professor Romano describes the program in these words:

Higher education is increasingly becoming available to students who have not traditionally been part of the collegiate environment. These "new" students include men and women returning to school after several years absence, ethnic minorities, single parents, and individuals with weak prior academic backgrounds. In addition to the usual stresses and tensions associated with attending college, these "new" students often experience additional anxieties and tensions related to parenting, family responsibilities, finances, weak academic preparation, and unfamiliarity with the structure and culture of higher education. The General College of the University of Minnesota (Minneapolis) is an open admissions college which enrolls a high percentage of nontraditional students. The purpose of this program is to present an innovative counseling technique, EMG biofeedback training, as one method by which students may learn ways to better handle tensions and fears related to the educational environment.

EMG biofeedback relaxation training is a relatively recent innovation which employs physiological measurement to teach bodily relaxation. EMG biofeedback training involves placing a person within a closed feedback loop with an electromyograph to provide the trainee with continuous and immediate information about a particular muscle group. The physiological feedback provides an opportunity for learning awareness and control of the musclar activity.

Biofeedback training has been used as a method to teach relaxation and stress reduction in educational settings. It has been shown to offer promise as a technique to reduce common student fears associated with taking examinations, giving oral presentations, and attempting math courses. It may be especially useful when used as an adjunct to existing counseling interventions, such as Jacobson relaxation training and systematic desensitization.

Arts, Communication, and Philosophy Research: Commanding English

Professor Evelyn Unes Hansen describes the origins of this program in these words.

Late in 1977, we began to be aware of increasing numbers of "foreign" students among our General College population. At one of those between-sessions periods when hordes gather in the hall waiting to register and we are down to about ten open courses, we had large numbers of such students, many of them barely able to understand us, and most of them intent upon enrolling only in those technical or specialized or mathematics courses that they had come to the University to study. It was a frustrating situation for them and an eye-opening one for us. Professor Zanoni and I were on duty that day. We discussed the need for helping these students improve their English skills,

for we sensed that unless they did, college degrees would be beyond their reach. During the remainder of the academic year, informally and in our advising, we followed the progress of many of these "foreign" students and discovered, for many of them, a quite clear pattern of Ns Ws and Is. At the time, most of the students were from Arab-speaking countries and from South and Central America.

A year later, in the fall of 1978, Professor Zanoni invited a group from the Division of Arts, Communication, and Philosophy (Professors Arrington, Gidmark, Hansen, Hattenhauer, and Stockdale) to join Dr. Sandra M. Dylla, Director of the Reading and Writing Skills Center, to address the problem and to propose some program for assisting non-native speakers of English, He appointed Dr. Dylla chair of the committee.

Professor Dylla, who became coordinator of the program, and Professor Jill B. Gidmark, an instructor in the program, pick up the historical narrative in a report made to the College English Association Conference held at Dearborn, Michigan, on April 11, 1980:

"Why Johnny Can't Read" and "Why Johnny Can't Write" articles and analyses have been turning up throughout the media and education press for some time. We have heard the cry "Back to Basics," and many of us have attempted to heed it. In fact, the basics are not all that new to the faculty of the Arts, Communication, and Philosophy Division of General College, an open admissions college of general education at the University of Minnesota. Our courses in the basics - reading, comprehension, study skills, vocabulary development, grammar and usage - go back nearly to the inception of the college; our Reading/Writing Skills Center, offering instruction and tutoring in the basics, has been in existence since 1972, and the teaching methods, approach, and curriculum of our writing lab courses are recognized by the University of Minnesota as fulfilling the freshman composition requirement.

All of this, of course, might be expected; we have been educating non-traditional students for nearly fifty years, and we know that non-traditional sutdents - whether they are non-traditional because of age, educational experience, ethnic or racial background, linguistic heritage, or socio-economic background - more often than not have poorly developed reading and writing skills. And so we have given them skills courses, piecemeal, in individual, sometimes isolated, units. And we have wondered why they have progressed less rapidly than we had anticipated. During the Fall Quarter, 1978, for example, 48 percent of the 420 minority and disadvantaged students who attempted a full-time course load of at least 12 credits completed only six or fewer credits. Of those students, 119 did not complete any credits. Clearly, difficulty with reading and writing skill development is not the sole cause of losing these students, but neither are our skills courses enough of

a factor to retain these high risk students. We need to handle the skills problems of our students more rapidly and more effectively, if they are to reach their educational goals. Two groups of our students face greater frustration in developing their skills, both of them groups for which English is not the sole native tongue. For these students, international and resident alien students and bilingual Chicano students, development of their aural, oral, reading and writing skills is crucial.

Put simply, non-traditional students - whether native English speakers or not - often require more than a few remedial courses and a writing course sandwiched into their other curriculum. We work with students who have professional goals - to become lawyers, business people, social workers, engineers, and physicians. Not only do they lack the necessary writing and reading skills for these fields, they lack the reading and writing skills necessary to survive in introductory coursework that might lead them to these fields. They need a way to develop the skills they need for good performance in college coursework before they take introductory courses in areas they are interested in pursuing.

We have, we think, developed one approach to the needs of the non-traditional student that overcomes some of these problems. Throughout the academic year 1978-1979, a committee of interested faculty members met weekly to prepare a two-quarter integrated package of courses that would strengthen the nascent communication skills of non-traditional students. The purpose of the package is to enable the student to develop a command of English in all modes of communication - hence its title - Commanding English. At the outset, we focused on the needs of the particularly high-risk population of non-native and bilingual English speakers. Working with these students in separate skill development courses had been only partially successful, because we were expecting them to see relationships that were obvious to us or to the more highly skilled students. As we analyzed the needs of these bilingual and non-native English speakers, we realized that we had to integrate all communication skills - especially reading, writing, and speaking. While reading and writing are the most obviously weak skill areas, many of our students are just as handicapped by their oral skills - they do not know how to phrase questions, how to request assistance, how to deal with the University bureaucracy. They can speak but not always communicate. Furthermore, even for those students whose oral skills are more developed and versatile, the integrated approach makes sense. The correspondence between writing and speaking is not precise, but much can be learned about the area of written communication - whether one is giving or receiving the written language - by looking at what we do more readily and frequently in speech. We will go into examples in a moment; for now it is important only that we see greater success and less frustration among high-risk students when their skill needs are integrated into a coherent package.

In developing Commanding English as a pilot project, we necessarily limited class size to twenty-five students. In addition, we developed certain enrollment policies for the package. International students were required to report their Michigan Test of English Language Proficiency scores to the College, and only those students whose scores were above 65 were admitted to the program. Those who scored lower were referred to the Department of English as a Second Language (ESL uses a score of 80 to indicate proficiency in English). Resident alien students and Chicano students took the General College Admissions Comprehensive, and were encouraged to enroll in the program if their scores on verbal and organizational skills were below the 50th percentile. Students, if they chose to register in the program, were committed to the sequence of courses the program faculty had planned for them, and to no others.

The first quarter curriculum is a full-time course load - especially essential to the non-traditional student who may be dependent on financial aid for economic survival. The two required courses with the science or social science elective of the second quarter also equal a full-time load. During the first quarter of the sequence, the courses which meet in a classroom setting are "Vocabulary Development," "Reading Comprehension and Study Skills," and "Oral Communication: Interpersonal Communication." Two other courses are also required in this quarter, "Improving Spelling and Punctuation" and "Writing Grammatical Sentences and Developing Organized Paragraphs"; both are offered as self-paced, tutorial, individual study courses through the Reading/Writing Skills Center and are scheduled at the student's convenience. In addition, the students meet with the faculty team of instructors in an informal discussion session weekly.

During the second quarter, the students are offered two required classes in communication skills, an introductory freshman composition course - "Writing Lab: Personal Writing" - and "Oral Communication: Group Discussion," and a "content" course in a science or social science. To assist the students in making the transition to unsheltered courses - as their elective course is - they are encouraged to take an optional individual tutorial course in "Improving Study Skills and Reading Comprehension" from the Reading/Writing Skills Center. In this course, they learn the terminology, study methods, and note-taking and test-taking techniques necessary in the discipline of their elective course. Our intention in developing Commanding English was to create a bridge from a sheltered environment - in which students could both compete with and assist students like themselves in developing language skills - to participating and succeeding in regular language classes.

We knew, of course, that we had to unify the work of the individual courses, to reinforce the common goals of the courses, and to interrelate course materials, or the Commanding English program would simply fall apart into a series of discrete units - which was what students had previously been offered, with only partial success. In Commanding English, the relationships between various communication skills are not assumed; they are emphasized.

At the outset, Commanding English was designed for a group composed of students from South Vietnam, Laos, Nigeria, Yugoslavia, France, Spain, Saudi Arabia, Libya, and Kuwait. This later was referred to as the International Group when other students became involved in the program. Commanding English also was aimed initially at students who had had training in the English as a Second Language Program (ESL) offered in the College of Liberal Arts under the direction of Professor Betty Robbinett, but who still were not ready for "mainstream" registration. Chairman Dylla and the committee worked out an agreement with people from ESL accoring to which we require a score of 65 on the Michigan Test of Language Proficiency for admission to our program.

As 1978-1979 advanced, other groups began to take advantage of Commanding English until, but the end of spring, 1980, the ACP Division will have completed:

One 2-quarter sequence for International Students
One 2-quarter sequence for Chicano-Latino Students
One First quarter sequence for a mixed class of International and Chicano Students
One 2-quarter special sequence for Chicano students who spoke no English to prepare them for admission to the S'80 Commanding English program. (This special sequence was taught by Sally Lund-Chirinos and Elizabeth Rosenberg.)

When word of Commanding English reached CLA's Professor Nobuya Tsuchida, he asked Dr. Dylla to offer a special section next year for students from Southeast Asia. The application seeking funds to support this section points out that General College has been admitting Asian immigrants in increasing numbers, and that their English needs are quite different from those of international students:

> Young refugees who attended American high schools have acquired the oral and aural skills for life in the United States, but not the reading and writing skills either in their first or second language. International students, on the other hand, often excel in reading and writing, while needing more work in speaking and listening. Furthermore, those

Indo-Chinese who already have received college or professional degrees in their mother countries are usually older than international students, but generally lack all of the aforementioned skills. Unable to present their transcripts or diplomas, the college educated refugees have to do undergraduate studies all over again in their host country.

In view of the unusual circumstances of Southeast Asian students, it has become necessary to develop a Commanding English program geared specifically to this group's particular needs. The proposed project will provide the immigrant students with a sheltered environment in which they can develop friendships to counteract further alienation at such a huge institution as the University of Minnesota. Contrary to a view that a segregated class might retard this group's integration into the mainstream of American society, a bicultural approach will speed up this process by facilitating adjustment to the University community.

A detailed analysis of Commanding English will appear before long, perhaps in the form of an edition of General College Studies. Dr. Dylla and her colleagues are assembling data. ACP's research coordinator, Professor Michael Arrington, is serving as consultant and facilitator. Meanwhile, Professor Hansen has this to say about the effectiveness of the program:

Much is due to the strong relationships developed among members of this team, and to the almost daily interchange of information about classroom events and potential student problems. Weekly meetings throughout the entire year - a separate hour each week for the International section and one each week for the Chicanos - were very useful for keeping the team informed and able to act quickly on matters that needed attention, and to make necessary revisions in plans. Also, the team met for one hour each week with the students in the International section, so we had much exchange of communication.

But in my opinion, the master key to the program's effectiveness is in the centrality of Sandra Dylla as chairperson. As Director of the Skills Center, she was able to bring into the team a group of teaching associates and tutors, to train them for working with the students, and to monitor their work. Daily, as problems arose with the students, we would report to her, and she immediately called the student in and assigned a tutor to the problem, thus arranging for additional help in whatever area the student was faltering. Without her the program would not have the degree of success that it has achieved.

Social Studies: Peer Group Tutoring in a Psychology Course

Professors Henry Borow and Thomas Brothen presented a report of a developmental research project (which has been underway in GC 1221 Psychology in Modern Society since 1972) to the 87th annual convention of the American Psychological Association held in New York, September, 1979. They describe their investigation in these words.

> A principal research focus of the project has been upon the development of a large-scale instructional model which preserves the small-class properties of (a) experiential learning, (b) high frequency of individual student-staff contacts, and (c) a participant (vs) receiver role for the learner. We have integrated into our design such principles of learning and behavioral instruction as academic achievement role modeling, student self-monitoring of progress, overlearning, recitation and review, immediate in-class feedback on unit quiz performance, test climate desensitization, and computer-assisted instruction on the method of experiment in the behavioral sciences.
>
> In generating our model, we imposed the conditions that an effective, comprehensive instructional system (a) yield both objective student performance and subjective course rating outcomes exceeding those of the conventional, large lecture class, (b) show cost effectiveness by keeping unit student instructional costs comparable to conventional lecture classes, and (c) be potentially generalizable or exportable to large classes in other academic disciplines. What has evolved is a pyramidal structure with students at the base, and at successive levels, undergratduate tutors, student assistants who serve as tutoring coordinators, and instructors in the joint role of teachers and instructional-system managers.
>
> Experience indicates that our students do not favor strict reliance on Keller-based PSI devices as self-pacing and 100% unit mastery or the complete elimination of lectures, but instead prefer regularly scheduled class assignments and unit quizzes and learning activities which are organized around time-structured lectures and practice-problem sessions. Lectures are not primarily employed to provide a comprehensive and detailed treatment of each topic but rather as a device to frame the current topical unit, pose seminal questions to be pursued and raise student motivation level. In this teaching context, lectures are intended as a precusor and facilitator of the several student-centered components of the learning system.

Tutors are not drawn from the pool of paychology majors. They are products of the pyramidal instructional model who are motivated to enter the program out of interest in the subject and the opportunity to serve as tutors. Students with superior course achievement in the introductory course are invited to apply as tutors for the following academic term. Efforts are made to enlist some students from ethnic minorities. The peer tutors are not utilized principally as proctors and grading assistants, as in many teaching designs reported elsewhere (c.f., Maas and Kleiber 1975), but rather as bona fide teacher aides and instructional management assistants. In his classic paper "Good-bye, Teacher," Keller (1963) notes that the use of proctors in PSI as test givers and scorers leads to almost unavoidable tutoring. In our Minnesota model, the teaching function is not incidental to the other duties of the tutors. Instead, they function as resource agents for students on a daily class basis, serve as learner role models, and in sessions immediately preceding weekly quizzes conduct tutoring group activities centering on practice quizzes, technical terminology, and discussion issues.

We have resisted the temptation to use tutors as unpaid teaching assistants who are rewarded solely for their contribution to the instructional process in the form of grades and credits unrelated to measured achievement. Our tutors register for a special four-credit, upper-division course offered as a weekly seminar in which they (a) study factors in academic motivation and achievement and principles of instructional technology relevant to their role as in-class tutors, (b) present oral and written reports on special topics, as, for example, bystander behavior or psychological factors in aggression and violence, and (c) take a written final examination based upon the series of topical seminar reports.

After describing additional aspects of this experiment, and detailing progress in various assessment projects, Professors Borow and Brothen go on to ask...

What lies ahead for our research and development program? First, it is clear that we must still learn how to make better use of our student tutors. We concede that our experimental model has not yet fully explored the potential contributions of the peer tutoring component to objective performance outcomes. It has been our regular practice to prepare tutors for their in-class assignments by means of weekly briefing sessions conducted by the coordinator of tutors. We now have under way a project designed to standardize and strengthen the weekly preparation of tutors through the construction of prototypic modules. The modules, which are keyed to problem-solving worksheets, will be presented as synchronized filmstrips and audiocassettes by means of the Beseler Cue/See apparatus. Two modules have been developed by means of which we intend to reassess the contribution of the tutorial feature to the efficacy of our experimental model of instruction.

Secondly, now that we have learned to cope with the mechanics of the instructional managment system, we intend to further reduce the contribution of the lecture component and to infuse the model with supplemental experiential learning and demonstration projects. For the past few years we have employed a computer-assisted instruction exercise of our own devising which teaches the method of experiment in the behavioral sciences. All students in the tutored sections use the computer terminals at the University's Learning Resoruces Center. This teaching unit is now catalogued in a national network of computer-linked learning programs (EDUNET). Another project uses an experiential approach to teaching how behavioral scientists make observations and adduce evidence. This unit requires all students to collect information on driver behavior at stop signs, to tabulate their findings, and to draw proper interpretations. In developing our bank of experiential projects, we intend to make fuller use of such creditable resources as the Maas-Kleiber Directory of Teaching Innovations in Psychology (1975) and the Johnson-Ruskin Behavioral Instruction (1977).

Finally, we have indicated that the student population of the General College numbers a significant cohort of nontraditional, academically high-risk individuals. We observe in many of these students manifestations of the abortive, unproductive learning behavior and the external locus of control orientation that is now well documented in the counseling literature. As rises continue in the percentages of American high school graduates who enter post-secondary institutions of learning (presently over 50 percent), such non-traditional students are becoming increasingly common in the great majority of American colleges and universities. We are only now beginning to understand and to deal with their special learning requirements. The General College has very recently been given special internal funding to mount an attack on the student retention problem, and some curriculum developments and instructional methods will be increasingly shaped to the needs of these students. The instructional strategies described in this presentation have given us some measure of success with the academically marginal students in this non-traditional population, but it has been modest at best. In the further development of our experimental tutorial model in introductory behavioral science, we intend to turn our attention more directly to this group.

Science, Business, and Mathematics: Self-Paced Instruction in Mathematics

General college mathematics instruction was reorganized in an individualized self-paced format, in 1973. Professor Douglas Robertson, currently in charge of programmatic development in mathematics, and his colleague, Ph.D. candidate Joan Garfield, described the system as it was then at a meeting of the National Council for Teachers of Mathematics held in Seattle, April 16-20, 1980:

As the course was set up, students were pre-tested on the first day of class and then, based on these pre-test scores, were given material to study which was consistent with their mathematics deficiencies. As a result, it was not necessary for students to study materials they already had mastered, nor did they have to begin at a level which was too advanced for them.

The original program served about 100 students and had seven major characteristics:

1) Pre-testing: All students were pre-tested on the first day of class to ascertain which areas of mathematics (whole numbers, fractions, decimals, percents, or algebra) they needed to work on. Students agreed upon learning contracts based on their pre-test scores.
2) Self-pacing: Since the abilities, backgrounds, and needs of students varied widely, it was decided that they should be allowed to progress through the course at their own individual rates.
3) Semi-programmed Textbook: Since the course was self-paced, a semi-programmed textbook was adopted. Students studied the text and worked through sample problems in class. Instructor and assistant were available to answer questions.
4) Audio Tapes: Since many students had poor reading skills, audio tapes, provided by the textbook publisher, were employed. The tapes enabled students to hear the material while they were reading it.
5) Diagnostic Practice Quizzes: Self-correcting diagnostic post tests were provided for each unit. The questions were set up so that, if a student missed a particular item, he could return to the part of the textbook which discussed that topic.
6) Mastery Learning: We decided that the math taught in the program was hierarchical in nature and, thus, before going on to further areas of study, a student should exhibit a specified level of mastery of material completed. Students who did not reach this mastery level on post tests were required to restudy the material and take a different form of the unit test until mastery was achieved. A credit was earned for each unit test completed at the specified level of mastery.
7) Mathematics Tutorial Center: A room for drop-in tutoring was staffed six hours a day by instructors and assistants. Students can drop in for help with any kind of math problem. After two years of operation, the program was enlarged. Class size increased from 30 to 45. Approximately 400 students were served every quarter. A special testing room made unit examinations available at any time during the day.

Professor Robertson goes on to outline the history of this approach to college mathematics during the years between 1973 and 1978. After describing a series of surveys and pilot studies, he continues by explaining the placement

capability and course flexibility the faculty hope will be achieved in a new program offering both lecture and programmed methods of instruction, which will continue experimentation in General College mathematics under Professor Robertson's direction in 1980-81.

In the fall of 1978, we conducted a research study designed to determine which student characteristics would cause one type of instruction to be better than another for individual students. If such an Aptitude Treatment Interaction (ATI) existed, and if we could identify the interaction, we would be able to place individual students in the learning environment which was best suited to their own cognitive preferences.

The study was conducted in two separate consecutive, ten-week quarters using 371 students enrolled in our arithmetic course. The students were pre-tested to make sure that they were all at the same mathematical level (i.e., they could work with whole numbers, but needed work in franctions, decimals and percentages).

The two instructional treatments employed closedly resembled our programmed and lecture classes.

1) Programmed/self-paced: In some sections students learned the course material at their own individual rates by reading from a semi-programmed textbook. An instructor and a teaching assistant were available to answer questions.
2) Lecture: Other sections of the course were conducted in the traditional way - the teacher paced the course and, through the use of classroom lectures, served as the main source of new information.

On the first day of class, students were randomly assigned to one of the two experimental treatments. The Academic Motivations Inventory (a 16 subscale inventory of academic motivations), the Mathematics Attitude Inventory (a 6 subscale inventory of student attitudes toward mathematics) and a short questionnaire then were administered . Students' verbal abilities had already been tested during this regular orientation/registration process.

As the quarter progressed, students in both types of classes covered the same material, in the same order, and took the same unit tests. For the programmed sections, mastery learning was not used.

At the end of the quarter, a discriminant analysis was carried out on the data in order to identify those pre-treatment aptitudes which best discriminated between highly successful students in the two instructional treatments. The 7 best discriminating aptitudes were found to be

1) verbal ability
2) debilitating anxiety
3) reason for taking the course
4) thinking motives
5) desire for self-improvement
6) dislike of school
7) affiliation motives

From these 7 aptitudes, a discriminant function was constructed for the purpose of predicting the instructional treatment which each student had received. Students who received the same treatment as was predicted by the discriminant function were considered properly placed, while students who received the opposite treatment were considered improperly placed.

An analysis of variance was used to determine whether or not the mean achievement levels of the properly and improperly placed students were significantly different. Achievement level was defined as a linear combination of the number of credits earned and the criterion test averages. The null hypothesis of equal achievement means for the 122 properly placed students and the 86 improperly placed students was rejected at the .01 level ($p = .001$). The analysis indicated that the properly placed students were significantly more successful than the improperly placed students.

The study was replicated the following quarter and similar results were obtained.

The conclusion drawn was that a significant interaction between the instructional treatments and the seven pre-treatment aptitudes identified did exist. In addition, a viable placement procedure could be developed for the purpose of matching students and instructional treatments. However, the amount of time needed for testing the students limited the usefulness of the results.

We also found that, ignoring student characteristics, students in the lecture sections generally were more successful than students in the programmed sections. We used as criterion variables both the quantity and the quality of learning - that is, we used a linear combination of the number of units completed by the student (quantity) and the student's test average (quality).

Based on these experiences and research, our math program has been redesigned for Fall, 1980, to allow students to select basic math courses offered in three different modes of instruction:

1) Lecture: Students will be placed in appropriate lecture sections based on their performance on the General College Entrance Placement Test. There are five possible levels of entrance.
    a) whole numbers
    b) fractions
    c) elementary algegra
    d) intermediate algebra
    e) college algebra
2) Self-paced/Programmed: These will be structured as they have been in the past, with an instructor and an assistant in a classroom setting helping students who are working in a semi-programmed textbook. We will continue to have a few of these sections.
3) Independent Study: Completely unstructured courses will be offered through the Mathematics Tutorial Center. Students will work independently but they will be able to seek out and receive help, when needed, in the Mathematics Tutorial Center.

Until we can overcome the administrative problems involved with using the results of the ATI research (time required in testing students and scoring tests) we will allow students themselves to choose the mode of presentation they feel would be best for them.

The classes will be set up so that students can transfer from one kind of presentation to another (assuming that the students has the proper background). We hope that this will enable those who fall behind in one type of class (a lecture class, for example) to transfer to another type of class (a programmed class, for example, during the quarter and continue their studies. Also, a student who is able and willing to move through the material faster than the remainder of the class may switch to a self-paced section.

These studies, one from each of its major divisions, are prime examples of research "within the mission and goals of General College." They are based upon the known characteristics and needs of our students. They focus upon effective instruction. They proceed through observation, hypothesis, experiment, and evaluation to change dictated by the evidence of concrete data. They are significant to all higher education today, because the highly varied and complex student body benefitting from this work respresents the whole spectrum of the contemporary American people. That is one of the main reasons why the present General College faculty places such a premium upon publishing results of its research.

General College In-House Publications

General College faculty have reported General College research at professional meetings held throughout the United States during the 1979-1980 academic year. The three projects described in these pages are ready examples. Professors Dylla and Gidmark described Commanding English at a convention held in Dearborn; Professors Robertson and Garfield spoke in Seattle; Professors Borow and Brothen presented their findings in New York; and Dr. Brochen will discuss them again at the Sixth International Conference on Improving University Teaching to he held July 9-12, 1980, at the Ecole Ploytechnique Federale in Lausanne. All of these papers will become formal articles after further research and other refinements.

The number of journals interested in our work increases as American higher education increasingly is summoned to serve an enlarging cross section of the American public. Five national publications to which our faculty might devote more attention are:

Forum
The Forum for Liberal Education, a publication of the Association of American Colleges, is now in its second year. Topic oriented, each issue deals with a single issue from several points of view. (1818 R. Street NW, Washington, DC 20009)

The Journal of Higher Education
American Association for Higher Education
One Dupont Circle, Suite 780
Washington, DC 20036

Interdisciplinary Perspectives: A Journal of General and Liberal Studies
College of Basic Studies, Boston University
871 Commonwealth Avenue, Boston 02215
(now in its tenth year)

University College Quarterly: A Magazine of General Education
276 Bessey Hall
Michigan State University
East Lansing, Michigan 48824
(now in its twenty-fifth year)

The two latter publications are especially interesting to us. They appear under the sponsorship of the two institutions of higher education in this country which most closely resemble General College, University College at Michigan State, and the College of Basic Studies at Boston University. Both are direct descendants of General College, deliberately designed on the GC model.

But University College is being merged with the college of liberal arts on the East Lansing campus. Its program, and presumably its quarterly, are being discontinued. This situation may spell opportunity for us: Should General College change the nature of its own publications in order to fill the void left by the demise of University College Quarterly?

At present, our publications include...

The General College Newsletter (26th year)	An occasional publication under the direction of Dean Buckley which presents descriptions of current operations to a circulation list which includes GC personnel, campus officials, and administrative offices of Minnesota community colleges and state universities.
General College Studies (16th year)	An occasional publication issued under the direction of Dean Buckley with the assistance of the Research Consulting Group. Focus is upon formally reported, data-based, limited or specific investigations.
General College Monograph (first issue S'80)	An occasional publication issued under the direction of Dean Buckley with the assistance of the Research Consulting Group which presents the culmination of work reported in a series of General College Studies, or research of a character broader, more comprehensive, or longer sustained than that reported in GC Studies.

The number and scope of current investigations, and the need to inform higher education about them, combine to place heavy responsibilities upon Associate Dean Buckley and the Research Consulting Group. All-college projects should be systematized and assigned central budgetary support according to all-college needs and priorities. Beginnings made by this new administration appear promising. Faculty reactions and suggestions should be solicited early in 1980-1981, for we will want to give good and documented account of our stewardship in 1982, the General College Golden Anniversary.